

**Practice: 313 - Waste Storage Facility****Scenario: #1 - Waste Storage Pond, Small, under 50,000 cu ft Design Storage****Scenario Description:**

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of less than 50,000 ft<sup>3</sup>. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. When a liner is required to prevent seepage, plan the appropriate pond sealing and lining conservation practice standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561). Adequately protect liner at agitation and access points.

Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Solid/Liquid Waste Separation Facility (632), Waste Treatment (629) .

**Before Situation:**

Operator presently has a dairy or animal feeding operation where animals are confined in a small area for a period of time each day ranging from a couple of hours to 24 hours per day. The operation does not have a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**After Situation:**

An earthen storage structure constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan.

Typical design size : Design storage volume 45,333 ft<sup>3</sup>; 50' X 50' (bottom); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth below auxiliary spillway = 9.5' (design depth = 8'); (not included in volume - 1' freeboard below auxiliary spillway, 1' freeboard above auxiliary spillway and 0.5' sludge accumulation). Excavated Volume 1,350 CY, Earthfill Volume 1100 CY,

**Scenario Feature Measure:** Design Storage Volume

**Scenario Unit:** Cubic Foot

**Scenario Typical Size:** 45,333

**Scenario Cost:** \$4,604.09

**Scenario Cost/Unit:** \$0.10

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	\$3.06	1350	\$4,131.00
<b>Materials</b>						
Structural steel tubing, 2" diameter	1120	Structural steel tubing, 2" diameter, 1/8" wall thickness, materials only	Foot	\$3.45	11	\$37.95
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$217.57	2	\$435.14

**Practice: 313 - Waste Storage Facility****Scenario: #2 - Waste Storage Pond, Large, 50,000 cu ft or more Design Storage****Scenario Description:**

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of more than 50,000 ft<sup>3</sup>. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. When a liner is required to prevent seepage, plan the appropriate pond sealing and lining standard.. Vehicular and equipment access is addressed in Heavy Use Area Protection (561). Adequately protect liner at agitation and access points.

Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Solid/Liquid Waste Separation Facility (632), Waste Treatment (629).

**Before Situation:**

Operator presently has a dairy or animal feeding operation where animals are confined in a small area for a period of time each day ranging from a couple of hours to 24 hours per day. The operation does not have a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**After Situation:**

An earthen storage structure constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan.

Typical design size: Design storage volume 239,625 ft<sup>3</sup>; 75' X 140' (Bottom); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth below auxiliary spillway = 13.67' (design depth = 12'); (not included in volume - 1' freeboard below auxiliary spillway, 1' freeboard above auxiliary spillway and 8" sludge accumulation). Excavated Volume 5,800 CY Earthfill Volume 4,700

**Scenario Feature Measure:** Design Storage Volume**Scenario Unit:** Cubic Foot**Scenario Typical Size:** 239,625**Scenario Cost:** \$18,670.03**Scenario Cost/Unit:** \$0.08**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	\$3.06	5800	\$17,748.00
<b>Materials</b>						
Structural steel tubing, 2" diameter	1120	Structural steel tubing, 2" diameter, 1/8" wall thickness, materials only	Foot	\$3.45	15	\$51.75
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$217.57	4	\$870.28

**Practice: 313 - Waste Storage Facility****Scenario: #5 - Winter Feeding Structure, Concrete Floor, Concrete Curb and Wall****Scenario Description:**

A winter feeding facility is constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system for dairy cattle. This includes a building designed and installed from approved standard drawings to be used by dairy cows for shelter, a feeding area, and to temporarily store waste. The structure will store approximately 90 days of manure. This scenario is intended for situations where consistency of manure or geological conditions prohibit the use of earthen floors. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation.

Potential Associated Practices: Fence (382), Nutrient Management (590), Heavy Use Area Protection (561) and Roofs and Covers (367).

**Before Situation:**

Operator presently has a dairy without a waste management system adequate to handle the waste stream leaving the animal feeding facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**After Situation:**

This practice applies to the installation of a winter feeding structure on a dairy, as part of an agricultural waste management system for dairy cows. This includes a building designed and installed from approved standard drawings to be used by dairy cows for shelter, a feeding area, and to temporarily store waste. The structure will store approximately 90 days of manure. Unit costs include all labor and materials needed to build the structure. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan.

Typical design: The typical structure is an open sided building with metal trusses and metal roof designed for 100 dairy cows. floor area 5,577 ft<sup>2</sup>, (39' X 143'); 3'8" concrete end wall height, 8" concrete curb height, 2' footing depth with a 4" concrete floor.

**Scenario Feature Measure:** Building Footprint

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 5,577

**Scenario Cost:** \$25,150.63

**Scenario Cost/Unit:** \$4.51

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.73	103	\$75.19
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	\$3.06	69	\$211.14
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.00	24	\$48.00
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$313.38	50	\$15,669.00
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$99.18	69	\$6,843.42
<b>Materials</b>						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$23.93	69	\$1,651.17
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$217.57	3	\$652.71

**Practice: 313 - Waste Storage Facility****Scenario: #7 - Waste Storage Structure, Open Top, Concrete, Cast in Place****Scenario Description:**

This scenario consists of installing a cast in place concrete open top waste storage structure as part of an agricultural waste management system. This scenario should be used to install all cast in place concrete waste storage facility. The structure can be on grade at natural ground, totally buried or partially buried and has an open top. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. Typical facility design is a concrete basin structure (20 ft wide by 30 ft long with 2 ft high side walls constructed around or at a livestock feeding operation. design storage volume of 1,800 cubic feet. Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. When freeboard is required it may be provided by raising the concrete side wall or with constructing earthen berms.

**Scenario Feature Measure:** Cubic Foot of Design Storage

**Scenario Unit:** Cubic Foot

**Scenario Typical Size:** 1,800

**Scenario Cost:** \$5,146.37

**Scenario Cost/Unit:** \$2.86

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$313.38	4.5	\$1,410.21
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$99.18	24	\$2,380.32
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$3.73	74	\$276.02
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.00	176	\$352.00
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$217.57	2	\$435.14
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$146.34	2	\$292.68

**Practice: 313 - Waste Storage Facility****Scenario: #8 - Dry stack, earthen floor, wood wall****Scenario Description:**

This scenario consists of a dry stack facility with compacted earthen floor. This scenario is intended for dryer material such as poultry litter. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. To be used in conjunction with 367 - Roofs and Covers.

Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer.

**Before Situation:**

Operator presently has a poultry feeding operation where animals are confined in houses 24 hours per day. The operation does not have a waste management system adequate to handle the waste stream leaving the animal production facilities. Poultry litter, manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

The typical structure is an partially enclosed building, 40.3 ft (40'4") wide, 65 ft long, 6.0 ft deep for 100,000 broilers. The earthen floor will be prepared by stripping the top 1' of soil and roller compacting it back into floor. Walls are 4' pressure treated wood, 6" x 6" x 7' steel truss support posts set 10' c-c with 2' concrete curbing. Walls allow for greater storage volume. Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

**Scenario Feature Measure:** Building Footprint

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 2,620

**Scenario Cost:** \$7,939.65

**Scenario Cost/Unit:** \$3.03

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.00	8.5	\$17.00
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$313.38	17	\$5,327.46
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	\$2.08	183	\$380.64
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$3.73	93	\$346.89
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic yard	\$3.06	92	\$281.52
<b>Materials</b>						
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$0.82	1176	\$964.32
<b>Mobilization</b>						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$146.34	1	\$146.34
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$415.40	1	\$415.40

**Mobilization**

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$60.08	1	\$60.08
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**Practice: 313 - Waste Storage Facility****Scenario: #9 - Dry Stack, concrete floor, wood wall****Scenario Description:**

This scenario consists of a dry stack facility with concrete floor and is applicable when geologic, soil, climate conditions or state and local regulations prohibit the use of an earthen surface. This scenario is intended for dryer material such as poultry litter. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. To be used in conjunction with 367 - Roofs and Covers.

Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer.

**Before Situation:**

Operator presently has a poultry feeding operation where animals are confined in houses 24 hours per day. The operation does not have a waste management system adequate to handle the waste stream leaving the animal production facilities. Poultry litter, manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

The typical structure is an partially enclosed building, 40.3 ft (40'4") wide, 65 ft long, 6.0 ft deep for 100,000 broilers. The earthen floor will be prepared by stripping the top 1' of soil and roller compacting it back into floor. Walls are 4' pressure treated wood, 6" x 6" x 7' steel truss support posts set 10' c-c with 2' concrete curbing. Walls allow for greater storage volume. Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

**Scenario Feature Measure:** Building Footprint

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 2,620

**Scenario Cost:** \$10,851.01

**Scenario Cost/Unit:** \$4.14

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	\$2.08	50	\$104.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.00	8.5	\$17.00
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$99.18	31	\$3,074.58
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$313.38	17	\$5,327.46
<b>Materials</b>						
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$0.82	1176	\$964.32
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$23.93	31	\$741.83
<b>Mobilization</b>						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$146.34	1	\$146.34

**Mobilization**

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$60.08	1	\$60.08
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$415.40	1	\$415.40



**Practice: 313 - Waste Storage Facility****Scenario: #12 - Small Concrete Tank, less than 5,000 gallons****Scenario Description:**

This scenario consists of installing a small concrete tank with a design storage volume of less than 5,000 gallons that is totally or partially buried with several openings for direct loading from heavy use area, gutter cleaner or gravity pipe. Manure is held for 3 to 14 day on smaller operations or transferred to larger storage facility or direct land applied. Design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water.

Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), Pumping Plant (533), and Underground Outlet (620).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Tank typically 4' deep x 10' wide x 10' long, with a design storage volume of 300 cubic feet plus 1' freeboard. Sizing based on manure, other wastes, rainfall, lot runoff, etc. Volume does not include freeboard. Tanks associated with open lots sized to handle design storm in tank or in combination with lot as per state regulations.

**Scenario Feature Measure: Design Storage Volume****Scenario Unit: Cubic Foot****Scenario Typical Size: 300****Scenario Cost: \$2,373.93****Scenario Cost/Unit: \$7.91****Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$99.18	2.5	\$247.95
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$313.38	4	\$1,253.52
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	\$2.08	61	\$126.88
<b>Labor</b>						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$25.07	8	\$200.56
<b>Materials</b>						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$23.93	2	\$47.86
Waterstop, PVC, ribbed, 3/16" x 6"	1614	Waterstop, PVC, ribbed, 3/16" thick by 6" wide. Includes materials, equipment and labor.	Foot	\$3.61	40	\$144.40

**Mobilization**

**Mobilization**

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	\$146.34	2	\$292.68
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$60.08	1	\$60.08